CLAIMS

1. A three dimensional periodic structure, comprising:

two substances having different dielectric constants periodically distributed in a three dimensional space, and

a conductive film having a surface resistivity of about 0.3 Ω/square or more at an interface between the two substances.

2. A three dimensional periodic structure according to claim 1, wherein independent conductive particles or clusters of a plurality of conductive particles are coarsely distributed in the conductive film.

3. A three dimensional periodic structure according to claim 1 or 2, wherein the conductive film comprises a conductive material having a conductivity of about 10^3 S/cm or more.

4. A three dimensional periodic structure according to claim3, wherein the conductive film is an electroless plating film on a surface of at least one of the two substances.

5. A three dimensional periodic structure according to claim 1 or 2, wherein the conductive film is an electroless plating film on a surface of at least one of the two substances.

6. A three dimensional periodic structure according to claim 1 or 2, wherein the conductive film comprises Cu, Ni or InSb.

7. A three dimensional periodic structure according to claim 1 or 2, wherein one of the two substances is air and is disposed so as to have a diamond shape.

8. A method of producing a three dimensional periodic structure comprising irradiating light onto a light-hardening resin layer in cross-sectional pattern to form a layer of three dimensional periodic structure according to claim 1,

and then, at least once, causing a layer of light-hardening resin to contact the resulting irradiated structure and repeating the irradiation.